Urban Transportation Centers:
The New Town Square

The design of a high-speed rail depot as a focal point for a community

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Historically, in many American communities the railroad depot was the most important building in town. It was the gateway to the outside world and hub of commerce for the community. Often, cities would move so they could benefit from being connected to the railroad. Its social and economic impact defined America in the 19th and early 20th centuries. However, as the automobile developed and emphasis shifted away from the railroad, rail depots and their importance diminished. Their remains forever disappearing from the American landscape as towns and cities remove their tracks and destroy their depots. Passenger rail has been all but forgotten until today. New forms of rail travel are a viable alternative for cities now facing environmental and social problems caused by the automobile and its infrastructure. Regional high speed rail travel is a clean alternative to traditional forms of transit like the automobile and airplane. Similar to the effects of subway travel within a large metropolitan area, regional high speed rail can link towns and cities to create a larger regional city. The social and economic benefits could strengthen such an area and serve as a catalyst for development within each community. This thesis is an attempt to address these issues, to understand the theories that serve as the basis for this concept of regional high speed rail and to form an understanding of design at different scales of density.

"Two roads diverged in a wood and I -- I took the one less traveled by, and that has made all the difference."

-Robert Frost
Each day Americans are spending longer periods of time commuting to their place of employment even though they are traveling the same distances. (fig. 1-1) The lack of development and stigma associated with the inner city has driven people out to the fringes. New suburban communities are rapidly developing near cities with the hope that automobile commuter travel will be significantly reduced. National, state and local governments are spending more public funds each year to repair and replace automobile infrastructure that cuts through cities and divides neighborhoods. (fig. 1-2) Automobiles consume massive amounts of gasoline and contaminate the air quality with a variety of pollutants as they sit in traffic and idle. As a result, our nation is oil dependent, a situation which can be alleviated with alternative means of transit. One such alternative is regional high-speed rail.

In use in Europe, Japan and now in northeast United States, high-speed rail is an excellent means of mass transit. Traveling at speeds of 150 mph, travel time is much faster than automobile and air travel at comparable distances. (fig. 1-3) For example, one train can carry 450-750 passengers, depending on the train configuration, which is more than one or two Boeing 747’s. Linking major cities in the Midwest with a regional “hub and spoke” system would essentially increase the workforce for the entire region. For example, workers from Fort Wayne, Indiana could commute to Indianapolis on a high-speed train in less than half the time it would take to travel by automobile at favorable conditions. In reality, high-speed trains are just the catalyst for rethinking how communities are designed and initiating development around the depots that house them.

Understanding how people work and live within...
the urban and suburban environment is the first step to reinventing and refocusing communities. Peter Calthorpe, a noted New Urbanist states, "...the problem of the inner city must be approached as part of a larger regional strategy that includes affordable housing throughout the region, tax-sharing between cities and suburbs, revived mass transit, and regional growth boundaries as a way of directing growth back to the core." 1 By limiting the extent of growth, large cities and smaller communities can create richer environments within their existing context. We are no longer a nation of 1950's era nuclear families. Only a quarter of American households are now married couples with children and less than half of them depend on a single income. Since 1950, the percentage of women working has tripled. Our lifestyles have changed, but, the way we live has not. The world is changing as well, with the globalization of capital and labor, an eroding natural environment, a growing economic imbalance and a lack in faith in government and the public institutions they embody. People are responding by withdrawing to secluded communities where the illusion of safety and normalcy provide a false sense of security. In The Regional City, Calthorpe and his co-author William Fulton, describe this situation as well. "This retreat from a more public life is reinforced by our accelerating tendency to shape communities around special interests rather than around the places we live. 'Communities of interest' are the social and economic associations that we form from our particular lifestyle, employment, and social standing. A community of interest is a world filled with people of similar activities, ages, incomes, and values. It is the 'gated community' of the mind." 2 In contrast to communities of interest, are the random associations and interests formed in older communities and

**fig. 1-3:** In use in Europe, Japan and now in northeast United States, high-speed rail is an excellent means of mass transit. Traveling at speeds of 150 mph, travel time is much faster than automobile and air travel at comparable distances.

**fig. 1-4:** As with interstate movement through large cities, smaller communities can be affected by massive automobile infrastructure. In the case of this community, a short trip can take more effort while negotiating the traffic.
neighborhoods. These connections go beyond common interests and values and create a stronger bond within the community. However, as Calthorpe describes, "...as these more diverse 'communities of place' became more and more segregated by suburban zoning policies, we lost our day-to-day interaction with a wide range of people-people not encountered in our communities of interest. A landscape of isolated land uses became a landscape of isolated people."\(^3\) What isolates the people, within the selective developments of today, is that there is less common space, less civic ground to gather and unite their common interests. The act of walking in a neighborhood takes on a special significance. It unites the people as they move towards a common destination. Yet these social avenues are becoming few and far between in the current housing developments of today. At the next scale, these housing developments are becoming even more isolated from other cities and towns. According to Calthorpe, "we live simultaneously at the regional and neighborhood scale but lack a political structure to take advantage of their opportunities."\(^4\) Forging a clear connection between these scales strengthens our sense of community. The optimal connection for these scales is through public transportation. As Calthorpe states in The Regional City, "Without a diverse regional transportation network, our neighborhoods and towns easily become isolated pockets surrounded by congestion."\(^5\) Linking each of these communities with a transportation "hub" creates a "regional city", a collection of towns and cities linked together by a common thread. In the case of this thesis, the common thread is high-speed rail.

The importance of such a link is transferred upon the stations and depots that house these high-speed
fig. 1-5: Suburban developments like this one are typical of communities of interest. People withdraw to secluded communities where the illusion of safety and normalcy provide a false sense of security.

fig. 1-6: New developments that push further away from the city encroach upon the natural landscape and agricultural land.

trains. These gateways into their respective cities and towns are as important as the regional rail itself, and the amenities that are attached to this function create a new hybrid building type that is a focal point within a community. The term Transit Oriented Design or T.O.D. is a concept introduced by Peter Calthorpe in his book The Next American Metropolis. In the simplest of terms, "...transit-oriented development means reorienting the region around a system of light-rail lines emanating from a central city hub. Each stop becomes the town center for a mini new town, a mixed-use community with stores, jobs and diverse housing, all within walking distance of the transit stop with its links to other towns." Transit oriented development is a means of curbing sprawling communities by redefining the scale at which people travel and live. The need for vast amounts of land is diminished through the use of mixed-density buildings that combine residential, commercial and public functions and amenities, reduce the amount of land used, save natural landscapes and reinvent the urban center of cities and towns. The transit functions become the new town square, the center for all activity and the focal point for a community. It becomes a vital part of how the people work and live.
Fort Wayne, Indiana is a moderately sized city with a population of approximately 205,000. It is the second largest city in Indiana, the county seat for Allen County and the major economic center for northeast Indiana. Traditionally an agricultural and manufacturing driven economy, Fort Wayne is the location of a major truck assembly plant for General Motors and a military and medical technology design center for General Electric. In addition to manufacturing, Fort Wayne and the surrounding area are developing a niche in the medical technology field as a center for orthopedic prosthetics and implants. Zimmer Industries and DePuy Laboratories are world leaders in joint replacement technology. Fort Wayne is also home to five colleges/universities and numerous technical and trade schools. These companies and universities along with an emerging immigrant population are sparking growth throughout the city, particularly in the downtown area. This urban growth is cultivating a rich cultural diversity that would support a regional high-speed rail system.

The area that is selected to be the site for this study is located along the southern edge of downtown Fort Wayne. Currently the site is the campus for Lincoln Financial Group. Primarily involved in annuities, the company employs 2,000 people in the city. Founded in Fort Wayne, the company is currently relocating to Philadelphia, Pennsylvania. It is estimated within the next 10 to 15 years the company will be completely relocated and only a marginal number of employees will remain in Fort Wayne. The current facilities will be vacant and this area will need a new identity in order to be a contributing factor in the urban fabric. The site is 59 acres and comprised of the vacant railroad facilities, Lincoln campus, Baker Street Station, a Federal Courthouse and vacant buildings and lots. A majority of the proposed site is vacant lots and surface parking so the master plan
will focus on transit oriented infill development that links the existing downtown development with the new regional high-speed transit depot.

Traditionally this area was a mix of light industry and homes for the workers. It is also the location of the depot for the Pennsylvania Railroad so its connection with rail travel is strong. However, as dependence upon the railroad decreased and the city shifted towards other means of transit this area declined. Running longitudinally through the site are two sets of standard railroad tracks on an elevated plateau 20'-0" from street level. The streets pass under the tracks so that traffic is not interrupted by the trains but the elevated tracks create a perceived edge and divide the downtown area from the residential neighborhood to the south. To the north and east of the site are the major traffic arteries through the city. On the north side of the tracks on Baker Street is a historic Pennsylvania Railroad Station that is listed on the National Register of Historic Places. The station was active as a railroad depot from 1914 to 1988. Recently restored and renovated, the station is now home to an architecture firm, a law firm and an advertising agency. The concourse of the station is now used as a banquet facility. Further north of the site is the Federal Courthouse, Botanical Gardens, the recently expanded Convention Center and Headwaters Park. The convention center (known as the Grand Wayne Center) development along with the renovation of the Main Branch of the Allen County Public Library is part of an urban renewal initiative to draw interest back to the downtown area. In addition to the library and Grand Wayne Center renovations, the Allen County Courthouse has recently completed a $10 million dollar renovation. Built in 1902, the Courthouse is one of the finest examples of Beaux-Arts style public buildings in the nation. The friezes and cornices around the building are filled with sculpted images and proverbs of the history of Allen County, American government, industry, virtue and the law. Northwest of the site is the West End Historic District. This neighborhood is also on the National Register of Historic Places and is one of the earliest communities in Fort Wayne. Settled in the 1840's, the homes reflect the popular design styles of its time including excellent examples of Greek Revival architecture. To the south of the site is a developing neighborhood with an eclectic mix of nationalities from Central and South America. Local businesses and restaurants enrich the cultural experience of the neighborhood and the city as well. The site's proximity to significant cultural and civic landmarks plus location on a main passenger line are major attributes of this site and will support further development of this community.

fig. 1-10: Baker Street Station
Aldo Rossi's block redevelopment in Berlin along the Zimmerstrabe redefined the complexity of the mixed-density blocks within my master plan. Lying in the former newspaper district of the city this had become a forsaken area following World War II and the restraint of the Wall. By maintaining the historical edges of the block and the new courtyards within, Rossi preserves the block's contextual relationship while redefining the public/private aspects of the inner courtyards. His composition of façades breakdown the massiveness of the block and give each floor level its own identity pertaining to its use. Rossi kept Berlin's traditional eave heights with two attic or mansard storeys and blended modern design within its historical context. This project gave me the tools to form the vocabulary for the mixed-density blocks in my master plan. Although there is not a main historical connection within the site, I used the facades to reflect the type of atmosphere that I envisioned along the street, in the courtyards and the public spaces.
The design for Lehrter Bahnhof in Berlin by von Gerkan, Marg und Partner had a great impact upon the design for the transit depot. The station itself was constructed on the historic site of Lehrter Station which was an important crossing of many railroad lines in Berlin. The new station would be a point at which six (6) different high-speed trains and subway lines would cross. An estimated 30 million passengers would travel through this station yearly. The designer, Meinhard von Gerkan, describes the social and cultural importance of this rail exchange, "its proximity to the government district to the south adds to the importance of the station...the design of this building is strongly influenced by its urban and traffic planning importance." What is so impressive about this building is that it also houses 810,000 sq. ft. of commercial retail and office space. Two rectangular building volumes bisect the various levels of tracks and frame the central hall and its main entry. "Large openings in the floor of the station hall provide adequate natural lighting down to the platform level deep underground, guaranteeing good spatial understanding and clear orientation." Connecting the massive programmatic elements of the commercial space with the varying train platforms and their support spaces was not an easy task but was done elegantly. By expressing the forms as simple intersections with the tracks, von Gerkan was able to simplify the flow of movement through the building and link it with the surrounding context. He describes it as this, "the station building combines the function of being a station with the function of forming an urban link between government and town districts." This project provided a wealth of knowledge for the depot design and helped me understand the intricacies of a modern high-speed rail station. It forever changed how I viewed my design.
fig. 2-8: Train Platform Structural Model

fig. 2-9: (right) site plan

fig. 2-10: (left) section model
In an attempt to understand the heart of the depot, which I thought was the central atrium space, I began researching different architects who were successful with integrating public spaces in their designs. Through my research I discovered a monograph of Henrich, Petschnigg & Partner or HPP. Their designs were filled with “high-tech” architecture and had similar thoughts as I about integrating systems within these buildings. What impacted me the most was their design for the Provinzial Insurance Headquarters in Dusseldorf, Germany. The building is long and multifaceted composed of a narrow structure. “The glass spine between the buildings is composed of a 6 to 7 storey high gallery with glass roofing. The 2,200 employees pass from one building to the other via bridges, walkways and stairs.” This project is a study of the mass and void relationships created by large open spaces. Each atrium space fits the rhythm of the building and is not just a “hole” cut in the building for natural light. The success lies within the integration of pedestrian paths along and through these atrium spaces. Their social function is strengthened as the employees pass through and react to the space. Understanding these
principles helped me push my design. I found Santiago Calatrava's Berlin Spandau station a week or two after Lehrer Bahnhof had completely changed the way I thought about the depot design. Yet I was still intrigued by how it addressed the elevated tracks that were similar to the situation that I was dealing with. This project was a competition entry and was never built, but even in the entry model we can see the definition of the main public space, how it connects with the main terminus buildings and a clear delineation of structure which is common in all of Calatrava's work. As with Lehrter Bahnhof, I liked the way Calatrava protected the trains as the passengers were loading/unloading. It connects the tracks to the station and they become part of the building and that was a feeling that I wanted when passengers moved through the depot.

fig. 2-16: Berlin-Spandau Station
fig. 2-18:
Existing residential units in project site.

fig. 2-19:
fig. 2-20: View of the Botanical Conservatory and the Catholic Cathedral.

fig. 2-21: One of many abandoned freight houses to the south of the elevated tracks. In the background is a view of General Electric.
"Always design a thing by considering it in its next larger context -- a chair in a room, a room in a house, a house in an environment, an environment in a city plan."

-Elie Saarinen, "Time", July 2, 1956
The main goal for this master plan was to design an infill community that would support transit oriented development. Careful consideration and reference to the context and history of the site was always at the forefront of each design solution. My intent was that the nature of mixed density development within the urban environment would create a vibrant and eclectic community that would redefine how the people of Fort Wayne thought about community and living in a community.

I have always been interested with mixed density buildings because I liked the idea of a building changing as I moved through it. So mixed density made sense when I applied it to this urban design problem. The commercial functions on the first two storeys are the activator for the site, they bring the money in and sustain the area during the daytime. The residential functions increase the density of the area and allow these neighborhoods to be active 24/7. Each building is unique pertaining to amenities and different residential types (apartments, townhouses, etc.), so within
the microcosm of this neighborhood each building adds its own different character.

One of the most important ideas of good urbanism is for buildings to give positive definition to the shape and function of outdoor space. These outdoor spaces should encourage a range of activities so that social interaction within the community takes place. Good outdoor spaces enhance design and frame visual linkages between buildings. Outdoor spaces can also clearly define the difference between public and private. Lining the edges of blocks with perimeter buildings creates an inner courtyard that gives the users of that block a private area away from the public streetscape. Creating links from these courtyards integrates with the surrounding open spaces and the courtyards become nodes along a pedestrian street that runs parallel to the vehicular street. Courtyards also allow natural sunlight to penetrate deep into the buildings for good daylighting. As is seen on the upper right corner, a corridor width of approximately 45'-0" allows the sun to reach 70% of the visible surfaces year round. This is also good for traffic movement through the

master plan cross-section
public/private

A street width of 25'-0" with street parking, narrows the street and slows down drivers to an average of 20-25 mph. Street parking also gives pedestrians a sense of security because the parked cars act as a barrier between the pedestrian and moving automobiles. However, street parking is not enough to satisfy the parking requirements of an urban area. According to Andres Duany, "cities that wish to be pedestrian friendly and fully developed should provide public parking in carefully located municipal garages and lots. Parking must be considered a part of the public infrastructure, just like streets and sewers."
"Certainly, travel is more than the seeing of sights; it is a change that goes on, deep and permanent, in the ideas of living."

-Miriam Beard
The transit depot is essentially four (4) buildings in one. It has to serve as a mall with a variety of retail spaces, it is an office building that accommodates various business types, it is a hotel that caters to a multitude of guests and it is a high-speed train station that connects Fort Wayne with the rest of the Midwest. So to describe this building as a “transit depot” encompasses all forms of movement and not just a system of urban public transportation. By renaming this building type, the preconceived notions of the programmatic spaces are erased and can function as one.

After absorbing all of the precedents and readings, the transit depot took shape immediately. Ultimately, it had to imply movement and the question of whether to go over or under the tracks was not really an issue. The building had to embrace its site, so it literally embraced the tracks in plan and in section. Functionally, the building was a vice that held the elevated tracks together and where they split apart they expose the heart of the building, the atrium. These elements played a significant roll in the floor plan and development of the spatial relationships. The main level is commercial retail so it can draw the users into the building and activate the spaces. The main entries to the north and south are offset and a clear view through the building is not possible. Viewing out of each entry, the users are presented a picturesque perspective of the pedestrian mall to the north or the existing neighborhood to the south. By skewing the main path, the building users are exposed to the entire building. Movement through the transit depot becomes more interesting because you do not know what is around the next corner. As the users progress along the main level the atrium appears before them. The atrium is framed by the four anchors of the building, or the town square of the community. Since this building is the center of the development, the four anchors are the town square because they are the center of the activity. The town square is comprised of a retail anchor to the north, a restaurant to the south, the main vertical circulation to the east and the railroad ticket office to the west.

This building must function as a train station as well and movement from the main level to the second level where the high-speed trains are located is easily illustrated in the “fork” distribution diagram. Similar to an airport, the passengers
enter the building and purchase their tickets at a centralized location. From the ticket office the passengers disburse to the east towards three points of vertical circulation. Like an airport, these circulation points are marked on the ticket so that the passenger knows which “gate” to use. Once the passengers reach the second level they are able to orient themselves by viewing the atrium space and board the trains. Passengers unloading the trains would proceed in reverse order of the “fork” distribution. Since most of the high-speed rail passengers are commuters, the need for baggage distribution is not required, but can be added at a later date.

The remaining floors take on characteristics of their own, the north wing is predominantly commercial office space and the south wing is a hotel. There is a secondary entry on the second level that connects the transit depot to the parking structure to the west. Each hotel room or office has wonderful views of the atrium and the high-speed trains as well as the city. The offices and hotel rooms are naturally daylit because of the narrow floor plate and the light shelves that cast indirect light into the spaces. The light shelves also prevent solar heat gain on the south face of the hotel wing.
In retrospect, this project was more about the process than the end result. It was about the synthesis of thought from some of the greatest minds shaping our towns and cities today. The efforts of Peter Calthorpe, DPZ, Urban Design Associates, English Partnerships, HPP, von Gerkan, Marg und Partner, Santiago Calatrava, Douglas Kelbaugh and Andy Mitchell. Ok, well, Andy Mitchell is not one of the greatest minds shaping our cities today...yet. However, through this project and its different scales of design, I have begun to understand what makes great livable spaces. I also keep in mind that these spaces are complex and living structures that continue to grow. I would like to think that the T.O.D. communities are successful places and that the solution I have presented here would be a wonderful place to live and work, yet, I do not know. It gives me comfort when I see examples like Orenco Station in Portland, Oregon and know that this design type can be successful. I think this thesis was successful because I grew as a professional because of it and others around me did as well. I would like to end with a quote from Frederick Law Olmsted that I read in Suburban Nation that embodies this thesis, "There can be no doubt...that, in all our modern civilization, as in that of the ancients, there is a strong drift toward."
(Endnotes)

(Photos)
fig. 1-1: www.washington.edu/reports/state/graphics.html
fig. 1-2: Getty Images
fig. 1-3: www.eurostar.com
fig. 1-4: alex maclean
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fig. 1-7: http://g-lea.tamu.edu/map.indiana.gif
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